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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/295,329	04/21/99	KAWABE	Q54114

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IM62/1006

EXAMINER

CLARKE, Y

ART UNIT

PAPER NUMBER

1752

DATE MAILED:

10/06/99

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
09/295,329

Applicant(s)  
Kawabe et al.

Examiner  
Yvette Clarke

Group Art Unit  
1752



☒ Responsive to communication(s) filed on Apr 21, 1999

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-22 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-22 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☒ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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### **DETAILED ACTION**

This is written in reference to application number 09/295329 filed on April 21, 1999.

#### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Each of the claims recite the term "and/or" which render the claims indefinite. The examiner suggests using such language as, "a fluorine containing surfactant, a silicon-containing surfactant or mixtures thereof".

#### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoi (US 5,945,250) in view of Iwasa (US 5,691,111).

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Aoai teaches a positive photoresist composition comprising a sulfonium or iodonium salt resin capable of generating a sulfonic acid upon irradiation with actinic rays or a radiation. In one embodiment (2) the photoresist composition comprises the said resin and a resin having groups which decompose by action of an acid. Another embodiment (3) comprises a the composition of embodiment (2) and a low molecular acid decomposable dissolution inhibitive compound having a molecular weight of 3,000 or lower which has groups decomposable by an acid. A fourth embodiment comprises the composition of either (2) or (3) and a resin insoluble in water and soluble in an aqueous alkaline solution. Aoai also teaches an embodiment (5) having the resin (1), a low molecular acid-decomposable dissolution inhibitive compound having a molecular weight of 3,000 or less, and a water insoluble resin. (See column 5, line 20-51) The resin having sulfonium or iodonium salt has structural units represented by formulae (I) to (IV) is useful as a photoacid generator (column 5, lines 52-60). Specific example of the resin having acid decomposable group are presented in column 42, line 15-column 45, line 39, however the resin should not be construed as being limited thereto. A resin insoluble in water and soluble in an aqueous solution are referred to in the reference as an alkali soluble resin. Especially preferred alkali-soluble resins are novolak resin, poly(hydroxystyrenes) and copolymers of hydroxystyrenes and styrene, etc.(column 46, line 20-column 48, line 4). The acid-decomposable dissolution inhibitive compound is desirably either a compound which has at least two acid-decomposable groups in the molecular structure. Examples of specific compounds are presented in (column 50, line 20-column 85, line 40). The photosensitive composition of the reference may further contain other ingredients such as dyes,

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pigments, plasticizers, surfactants, and organic basic compounds (column 85, lines 61-67).

Desirable organic basic compounds usable in the reference are compounds which are more strongly basic than phenol, in particular, nitrogen-containing basic compounds (column 87, line 17-column 88, line 42). Preferred organic basic compounds are nitrogen-containing basic compounds having two or more nitrogen atoms per molecule having different chemical environments (column 87, lines 57-60). The photosensitive composition is used in the form of a solution in a solvent in which the ingredients of the said composition can dissolve. Preferred examples of solvents include propylene glycol monomethyl ether, ethyl lactate, methyl methoxypropionate, etc. The solvents may be used alone or as a mixture thereof (column 89, lines 13-26). A surfactant can be added to the solvent. Examples of the surfactant include nonionic surfactants fluorochemical surfactants, organosiloxane polymer and (meth)acrylic copolymers. The surfactant may be added alone or in combination of two or more thereof (column 89, lines 27-28). Table 2 exemplifies the use of a solvent mixture of ethyl lactate and ethyl 3-ethoxypropionate (7/3).

Aoai teaches all the limitations of the claims except the use of a polymer having an alicyclic hydrocarbon skeleton and decomposes by the action of an acid to thereby become alkali-soluble. Iwasa teaches a photosensitive resin composition useful as a resist for deep UV lithography containing sulfonium salts. The photosensitive composition according to the reference is useful in the range of 220 to 180 nm. The reference provides a novel alkylsulfonium salt which are represented by the general formula (1A) or (1B) and collectively represented by the

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formula (1C). The polymer for the photosensitive resin composition must be fairly high in transparency to deep UV rays. It is suitable to use a polymer which is represented by general formula 2 or 3 which contains a monocyclic or bridged cyclic hydrocarbon group (see column 6). The photosensitive composition is used as a solution in an organic solvent. Suitable solvents include methyl 3-methoxypropionate, ethyl lactate, and ethylene glycol monomethyl ether (column 7, lines 32-52). The said composition may also contain an auxiliary component selected from various additives such as surfactants, dyes, stabilizers and applicability improvers (column 7, lines 53-57). Iwasa discloses in his background that the existence of aromatic rings in the molecular structure of every acid generator produces strong absorptions at wavelengths shorter than 220 nm (column 2, lines 48-55). Iwasa also teaches that the presence of aromatic rings in the base component of the composition also causes strong absorptions in spectral regions shorter than 248 nm (column 2, lines 30-47). Therefore one of ordinary skill in the art would have been motivated to substitute the photoacid generator and the base polymer of Iwasa for the either or both of the suitable acid generators and the resin having groups decomposing by action of an acid as taught by Aoai. Motivation is based on the desire to develop a photosensitive resist composition that is useful in deep UV lithography.

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kawabe et al. (US 5,707,776), which teaches a positive resin composition sensitive to ultraviolet rays.

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Niki et al. (US 5,744,281), which teaches a resist composition for forming a pattern.

Maeda et al. (US 5,665,518), which teaches a photoresist and monomer and polymer for composing the photoresist.

Iwasa et al. (US 5,756,850), which teaches a sulfonium salt having a bridged cyclic alkyl group useful as resist for deep UV lithography.

Iwasa et al. (US 5,770,346), which teaches a photoresist and compounds for composing the photoresist.

Yamanaka et al. (US 5,939,234), which teaches a chemically amplified positive resist composition.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette Clarke whose telephone number is (703) 305-0589. The examiner can normally be reached on Monday - Thursday from 7:00 a.m. to 4:30 p.m. and alternating Fridays from 7:00 a.m. to 3:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Supervisor Patent Examiner Janet Baxter, can be reached at (703) 308-2303. The fax phone number for this Group is (703) 305-3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

ymc

September 28, 1999

Supervisory Patent Examiner  
Technology Center 1700  
Janet Baxter

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